REMARKS

In the Office Action dated April 11, 2003, the Examiner objected to claims 22 and 52; rejected claims 8, 13, and 42 under 35 U.S.C. § 112, first paragraph; rejected claims 15, 16, and 18 under 35 U.S.C. § 112, second paragraph; rejected claims 1-5, 9, 10, 14-20, 23, 24, 28-39, 43-50, and 53 under 35 U.S.C. § 102(e) as being anticipated by Donovan et al. (U.S. Patent No. 6,072,951); rejected claims 6, 7, 25, 26, and 31 under 35 U.S.C. § 103(a) as being unpatentable over Donovan et al. in view of Wang (U.S. Patent No. 5,940,616); and rejected claims 21, 22, 27, 51, and 52 under 35 U.S. C. § 103(a) as being unpatentable over Donovan et al. in view of Lanning (U.S. Patent No. 5,787,285).

By this amendment, Applicant has canceled claims 6-9, 11-13, 20, 24, 25, 29-34, 40-43, and 50 without prejudice or disclaimer, and amended claims 1, 10, 14, 15, 18, 21-23, 26, 35, 44, 45, 48, 51, and 52. Based on these amendments and the following remarks, Applicant respectfully traverses the objection and/or rejection of claims 1-5, 10, 14-19, 21-23, 26-28, 35-39, 44-49, and 51-53.

Objection to Claims 22 and 52

Applicant has amended claim 22 to depend on claim 19 and claim 52 to depend on claim 47. Accordingly, claims 22 and 52 are no longer duplicates of claims 21 and 51, respectively, and Applicant respectfully requests that the objection to these claims be withdrawn.

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Rejection of claims 8, 13, and 42 under 35 U.S.C. § 112, First Paragraph

Applicant has canceled claims 8, 13, and 42, and incorporates their recitations in independent claims 1, 10, and 35, respectively. Accordingly, Applicant responds to the rejection of claims 8, 13, and 42 in light of the added recitations to claims 1, 10, and 35.

The Examiner asserts that claims 8, 13, and 42 contain subject matter that is not described in the specification in such a way to enable one skilled in the art to make and/or use the invention. In particular, the Examiner argues that "it would be impossible to include an inline directive as part of a comment statement, since this would prevent the directive from ever being run." Applicant respectfully disagrees.

Applicant's invention is directed to methods and systems that perform inline functions to reduce the time needed to execute a program. In certain aspects related to the invention, subprograms are identified based on one or more execution characteristics. Using these characteristics, certain execution paths of an identified subprogram are selected for inlining. In one aspect of the invention, the execution paths are selected based on an inline indication associated with an execution path, such as an inline directive. The inline directive may be included as part of a program comment statement that is configured such that a compiler recognizes the statement as a special directive that is processed unlike other types of comment statements. .

Although Applicant agrees with the Examiner that the term "comment" has a well established meaning in the art (e.g., "text enabled in a program for documentation purposes..."), the "program comment statement" recited in claims 8, 13, and 42 (now incorporated into claims 1, 10, and 35) is associated with a program comment consistent with certain aspects related to Applicant's present invention, and is enabling

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as claimed. Applicant's specification clearly shows that an inline directive included as part of a program comment consistent with certain aspects of Applicant's present invention may be interpreted as a special directive. For instance, in describing the inline directive "c$dir INLINE PATH" included in the subprogram listed on page 13 of Applicant's disclosure, the specification states:

> [t]he 'c' indicates the language following is a program comment and the "$dir" indicates that the compiler is to interpret this comment as a special directive. In this example, the directive is named "INLINE PATH" and indicates to the compiler that this path or branch of the subprogram is to be inlined. By using the comment "c" syntax, if this code is evaluated by a compiler that does not have the logic consistent with the present invention modeled therein, the compiler treats the statement as a program comment and does not perform any action with respect to the statement.

According to Applicant's disclosure, at least certain statements having a particular syntax can be comments (*i.e.*, non-executable) in one sense and potentially executable (*i.e.*, compiled) in another sense. Such statements may host an inline directive to selectively inline computer code of certain execution paths of a subprogram when compiled in accordance with the present invention. Because Applicant's disclosure does enable one skilled in the art to provide an inline directive as part of a program statement, Applicant requests that the rejection of claims 8, 13, and 42 (now incorporated into independent claims 1, 10, and 35) be withdrawn.

Rejections of claims 15, 16, and 18 under 35 U.S.C. § 112, Second Paragraph

Applicant has amended claims 15 and 18 to associate an atypical characteristic with program code that requires special processing and a typical characteristic with program code that requires normal processing, respectively. These amendments are

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supported in Applicant's disclosure on page 11 and clarify the context of these types of characteristics.

Because claims 15 and 18 distinctly recite subject matter associated with certain aspects related to Applicant's invention, Applicant respectfully requests that the rejection to these claims under 35 U.S.C. § 112, second paragraph, be withdrawn and the claims allowed. Further, claim 16 depends from claim 15, and therefore is deemed definite under 35 U.S.C. § 112, second paragraph. Accordingly, Applicants also request that the rejection of this claim be withdrawn and the claim allowed.

Rejections under 35 U.S.C. § 102(e)

The Examiner asserts that Donovan et al. teaches all of the recitations of claims 1-5, 10, 14-20, 23, 24, 28-39, 44-50, and 53. Applicant respectfully disagrees.

Applicant has amended claims 1, 10, and 35 to include recitations similar to those of claims 6-8, 11-13, and 40-42, respectively. Accordingly, Applicant responds to the rejection of claims 1, 10, and 35 based on these amendments.

Donovan et al. discloses a system that enhances the performance of a compiler by inlining frequently executed paths of child procedures. The system estimates path frequencies for each procedure in a program and constructs a call graph representing execution paths between various child and parent procedures. Using the call graph, the system inlines frequently executed paths of each child procedure such that the inlined paths are executed with the child's parent procedure.

In contrast, claim 1 recites a method for inlining code of a computer program including, among other things, selectively inlining computer code of certain execution

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paths of a subprogram based on an inline directive included as part of a program comment statement associated with an execution path. Although Donovan et al. mentions the use of directives in col. 6, lines 36-38, the reference does not mention directives that are included as part of a program comment statement, as recited in claim 1. In fact, the Examiner contends that such a configuration is impossible, thus inferring that the above-mentioned recitations are not found in the prior art. As explained above, it is not impossible when using the appropriate compiler or runtime engine.

Because Donovan et al. does not teach each and every recitation of claim 1, Applicant requests that the rejection of this claim under 35 U.S.C. § 102(e) be withdrawn and the claim allowed.

Claims 10 and 35 include recitations similar to those of claim 1. As explained, claim 1 is distinguishable from Donovan et al. Accordingly, claims 10 and 35 are also distinguishable from this reference for at least the same reasons set forth in connection with claim 1, and Applicant requests that the rejection of these claims under 35 U.S.C. § 102(e) be withdrawn and the claims allowed.

Claims 2-5 and 36-39 depend from claims 1 and 35, respectively. As explained, claims 1 and 35 are distinguishable from Donovan et al. Accordingly, claims 2-5 and 36-39 are also distinguishable from this reference for at least the same reasons set forth in connection with claims 1 and 35, and Applicant requests that the rejection of these claims under 35 U.S.C. § 102(e) be withdrawn and the claims allowed.

Claim 14, as amended, recites a method of determining whether to replace subprogram code of a computer program including, among other things, identifying a

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subprogram that has a first and second execution characteristic that are each based on arguments operated on by the subprogram. The Examiner contends that Donovan et al. teaches these recitations because a statement is the same as an argument (see Office Action, page 6, lines 11-15, regarding the rejection of claim 20 now incorporated into claim 14). Applicant disagrees with the Examiner's position.

An argument is a value that is passed to a program routine. For example, an argument may be a value that is passed in one direction of a program flow, such as a data value that is used in a program function. A program statement is not the same as an argument because an argument may be part of a program statement. Accordingly, the number of program statements in a path disclosed by Donovan et al. cannot teach the characteristics recited in claim 14. Because this reference fails to disclose each and every recitation of claim 14, Applicant requests that the rejection of this claim under 35 U.S.C. § 102(e) be withdrawn and the claim allowed.

Claim 44 includes recitations similar to those of claim 14. As explained, claim 14 is distinguishable from Donovan et al. Accordingly, claim 44 is also distinguishable from this reference for at least the same reasons set forth in connection with claim 14, and Applicant requests that the rejection of this claim under 35 U.S.C. § 102(e) be withdrawn and the claim allowed.

Claims 15-19 and 45-49 depend from claims 14 and 44, respectively. As explained, claims 14 and 44 are distinguishable from Donovan et al. Accordingly, claims 15-19 and 45-49 are also distinguishable from this reference for at least the same reasons set forth in connection with claims 14 and 44, and Applicant requests that

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the rejection of these claims under 35 U.S.C. § 102(e) be withdrawn and the claims allowed.

Claim 23 includes recitations similar to those of claim 1. As explained, claim 1 is distinguishable from Donovan et al. Accordingly, claim 23 is also distinguishable from this reference for at least the same reasons set forth in connection with claim 1. Further, claim 23 recites a selected portion is defined by a selected path of a plurality of execution paths that may be executed by a subprogram and the selected path is determined by identifying a non-executable statement configured to direct the computer to interpret at least a portion of the non-executable statement as a special directive. Donovan et al. fails to teach a program comment statement that includes any code that directs a computer to perform any function, including interpreting the comment statement as a special directive. Accordingly, Applicant requests that the rejection of this claim under 35 U.S.C. § 102(e) be withdrawn and the claim allowed.

Claims 26 and 27 depend from claim 23. As explained, claim 23 is distinguishable from Donovan et al. Accordingly, claims 26 and 27 are also distinguishable from this reference for at least the same reasons set forth in connection with claim 23, and Applicant requests that the rejection of these claims under 35 U.S.C. § 102(e) be withdrawn and the claims allowed.

The Examiner also asserts that Donovan et al. teaches the recitations of claim 28. In particular, the Examiner contends that Donovan et al.'s use of frequency counters is equivalent to the step of identifying a subprogram that operates in a first manner when operands passed to the subprogram fall within a first range of values and

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that operates in a second manner when operands passed to the subprogram fall within a second ranges of values, as recited in the claim. Applicant disagrees.

The Examiner appears to take the position that Donovan et al.'s ability to detect when a frequency counter exceeds a threshold is the same as identifying a subprogram that operates in a certain manner when an operand having a range of values is passed to a subprogram. Applicant submits that tracking the frequency of executed paths in a subprogram is not the same as the identifying step mentioned above. Donovan et al. does not discloses passing operands to program code, much less identifying a subprogram that operates in any particular manner base don passed operands. On the contrary, Donovan et al. does not even disclose that the frequency counters are a part of the program code that form the program being compiled. The frequency counting mechanisms implemented by Donovan et al. operate in a manner similar to the well known inlining tracking tools that Applicant's claimed invention improves upon. Because the reference fails to teach the identifying and replacing steps as recited in claim 28, the rejection of this claim under 35 U.S.C. § 102(e) should be withdrawn and the claim allowed.

Further, the Examiner asserts that frequency counters are "often placed into the code in order to gather frequency information." The Examiner uses this assertion to support the position that Donovan et al. teaches the recitations of claim 28 (see Office Action, page 7, lines 8-9). Applicant traverses the Examiner's position. If the Examiner is asserting that Donovan et al. teaches frequency counters included in a program that is being compiled, Applicant requests that the Examiner specifically point out where in the reference such teachings are disclosed, as required by the M.P.E.P. If, on the other

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hand, the Examiner is alleging that placing such counters in a program and using the counters to perform a process similar to the identifying step recited in claim 28 is well known in the art, Applicants request that the Examiner provide a reference that teaches this configuration. As it stands, Donovan et al. does not teach the recitations of claim 28, and the Examiner has produced no evidence supporting the position that these recitations are taught or even suggested in a prior art reference. As explained, the association between the frequency counting mechanisms taught by Donovan et al. and the process steps of claim 28 are different, and thus Applicant requests that the rejection of this claim be withdrawn and the claim allowed.

Claim 53 includes recitations similar to those of claim 28. As explained, claim 28 is distinguishable from Donovan et al. Accordingly, claim 53 is also distinguishable from this reference for at least the same reasons set forth in connection with claim 28, and Applicant requests that the rejection of this claim under 35 U.S.C. § 102(e) be withdrawn and the claim allowed.

Claims 29-34 have been canceled. Accordingly, the rejection of these claims are 35 U.S.C. § 102(e) are moot.

Rejections under 35 U.S.C. § 103(a) in view of Donovan et al. and Wang

Applicant has canceled claims 6, 7, 25, 40, and 41 and incorporated their limitations into claims 1, 23, and 35 respectively. Accordingly, Applicant addresses the rejection of these claims under 35 U.S.C. § 103(a) in association with claims 1, 23, and 35.

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The Examiner admits that Donovan et al. fails to teach selectively inlining based on an inline indication associated with an execution path. To compensate for this deficiency, the Examiner relies on Wang to show inline directives (see Office Action, page 8, paragraph 9) . Applicant disagrees with the Examiner's position that these references, in combination, suggest the recitations of claims 6, 7, 25, 40, and 41 (now incorporated into their respective base claims 1, 23, and 35).

Although Wang shows the use of directives in a program to promote inlining for efficiency purposes, the reference does not teach or suggest an inline directive includes as part of a program comment statement associated with an execution path, as recited in claims 1 and 35, or a program comment statement that includes code directing the computer to interpret the comment statement as a special directive, as recited in claim 23. The directives shown by Wang are coded as normal program statements (see Wang, Figs. 8A and 8B). Accordingly, this reference cannot teach the directives or code as recited in claims 1, 23. and 35.

Because neither Wang or Donovan et al., alone or in combination, teach the recitations of claims 1, 23, and 35, Applicant requests the timely allowance of these claims.

Claim 26 depends from claim 23. As explained, claim 23 is distinguishable from Donovan et al. and Wang. Accordingly, claim 26 is also distinguishable from these references for at least the same reasons set forth in connection with claim 23, and Applicant requests that the rejection of this claim under 35 U.S.C. § 103(a) be withdrawn and the claim allowed.

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Rejections under 35 U.S.C. § 103(a) in view of Donovan et al. and Lanning

Claims 21, 22, 27, 51, and 52 depend from claims 14, 23, and 44, respectively. As explained, claims 14, 23, and 44 are distinguishable from Donovan et al.. Accordingly, claims 21, 22, 27, and 51, 52 are also distinguishable from this reference for at least the same reasons set forth in connection with claims 14, 23, and 44. Further, Lanning does not teach or suggest the recitations of these claims. Because neither Donovan et al. or Lanning, alone or in combination, teach or suggest the recitations of claims 14, 23, and 44, Applicant requests that the rejection of claims 21, 22, 27, 51, and 52 under 35 U.S.C. § 103(a) be withdrawn and the claims allowed.

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Conclusion

In view of the foregoing remarks, Applicant submits that this claimed invention, is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicant therefore request the Examiner's reconsideration and reexamination of the application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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